

Predation on Larvae of Douglas-fir Tussock Moth, *Orgyia pseudotsugata* (Lepidoptera: Lymantriidae), by *Metaphidippus aeneolus* (Araneae: Salticidae)

R. R. MASON AND H. G. PAUL

Forestry and Range Sciences Laboratory, Pacific Northwest Research Station,
U.S. Department of Agriculture, Forest Service, La Grande, Oregon 97850

Spiders are well-known predators of a variety of important forest insects (Allen et al. 1970; Bosworth et al. 1971; Jennings and Pase 1975; Loughton et al. 1963; Warren et al. 1967). Although spiders have occasionally been seen preying on small larvae of the Douglas-fir tussock moth, *Orgyia pseudotsugata* (McDunnough) (Wickman 1977), most field evidence of their predation on tussock moth has been either circumstantial (Dahlsten et al. 1977; Mason and Torgersen 1983; Mason et al. 1983) or from serological analyses (Fichter and Stephen 1984).¹ One of the most common arboreal spiders in fir forests of the Pacific Northwest is the salticid *Metaphidippus aeneolus* (Curtis) (Moldenke et al. 1987). These are small (<5 mm in length), gray and black spiders that are free-living and hunt for prey amongst the foliage. They are polyphagous predators and expert at stalking and pouncing on their prey. In extensive samplings of foliage of Douglas-fir, *Pseudotsuga menziesii* var. *glauca* (Beissn.) Franco, and the true firs, *Abies* spp., we found this species was ubiquitous in the mixed-conifer forests of the Pacific Northwest. We also observed that mature *Metaphidippus* spiders readily preyed on instars I and II of the Douglas-fir tussock moth when both species were confined together in a petri dish (Fig. 1). To examine further the predatory abilities of this group, we conducted an additional test under field conditions.

In late June 1981, shortly after natural egg-hatch of tussock moth, we selected nine white fir, *Abies concolor* (Gord. and Glend.) Lindl. ex Hildebr., in a mixed-conifer forest near Fort Klamath, Oregon. White fir is the principal host of the Douglas-fir tussock moth in that area. On each tree, we vigorously shook two 50-cm branches to remove all arthropods and then enclosed each branch separately in a nylon mesh cage slipped over the end of the branch. Five laboratory-reared tussock moth larvae (instars I-II) were stocked in each cage. We also added an adult *Metaphidippus aeneolus* in one of the two cages on each tree. All spiders were field-collected from the same stand. The cages were then closed at the base of the branch with a wire tie and left undisturbed.

¹Fichter, B. L., W. P. Stephen, A. R. Moldenke, and D. L. Dahlsten. 1982. Arboreal arthropod predation on Douglas-fir tussock moth larvae (*Orgyia pseudotsugata*) (Lepidoptera: Lymantriidae) as detected by ELISA. USDA For. Serv. Coop. Aid Agreement. Oreg. State Univ., Corvallis. Final Rep. 42 p.



Figure 1. *Metaphidippus aeneolus* feeding on larva (instar I) of the Douglas-fir tussock moth.

After 3 weeks, we examined the contents of each cage over a drop-cloth. The results were:

<i>Treatment</i>	Number of larvae stocked in nine cages	Number of larvae surviving after three weeks	Percent mortality
Larvae + spider	45	6	86.7
Larvae only	45	40	11.1

Surviving larvae developed normally and had grown to instars III–IV when reexamined. Of five larvae lost in the control cages without spiders, three were missing and two died of unknown causes. No larvae survived in six of the nine cages with *Metaphidippus* spiders; cadavers of preyed-on larvae were recovered in most of these cages. Four of the six larvae that survived with *Metaphidippus* were in a cage in which the spider had spun a silken retreat and laid a cluster of eggs. Egg laying and subsequent guarding of eggs may have reduced the rate of her predation (Krafft 1982).

These results clearly show predation on the Douglas-fir tussock moth by *Metaphidippus aeneolus*. The degree of feeding on tussock moth may have been exaggerated, however, because the spiders were confined and other potential or favored prey excluded. Mortality of larvae in the natural population, as determined in other studies, averaged 77 percent for several years during the same period (Mason and Torgersen, 1987). Because of its abundance in the foliage, *Metaphidippus aeneolus* could have been responsible for much of this loss. We and others have suspected for some time that spider predation is a leading cause of mortality of small larvae in low-density populations of tussock moth (Mason and Torgersen 1983; Mason et al. 1983).² These results provide further support for that hypothesis.

We thank R. C. Beckwith, D. T. Jennings, W. Maddison, A. R. Moldenke, and T. R. Torgersen for their constructive reviews of an earlier draft.

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²See footnote 1.